

Buford-Trenton Project

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Buford-Trenton Project

For years, tumbleweeds rolled across the desolate reaches of North Dakota, clogging an old irrigation ditch. The ditch was part of an early effort by the Bureau of Reclamation to irrigate lands near the confluence of the Missouri and Yellowstone Rivers. Substantial rainfall caused local farmers to lose interest in irrigation. Some thirty years later, Reclamation was back, trying to resuscitate the fortunes of dryland farmers, who had fallen on hard times.

Project Location

The Buford-Trenton Project is located in northwest North Dakota along the Montana border, in Williams County. The project lies along the Missouri River, just east of the confluence of the Missouri and Yellowstone Rivers and stretches for twelve miles, southwest to northeast, between the towns of Buford and Trenton. Along their southern perimeter, project lands hug three large bends in the north bank of the Missouri River, as it flows east. Between these bends lie the principal farming units of the project: the "West", "Middle", and "East Bottoms". Two natural creeks on the project flow into the Missouri. Eight Mile Creek stretches across the northern portion of the Middle Bottom, while Painted Woods Creek meanders across the East Bottom.

From the Missouri bottomlands, the project reaches north for three miles until it runs into the Great Northern Railroad line, built on the plain above the project. Williston, the largest town in Williams County, is four miles east of the project. Altogether, the project irrigates 7,655 acres of land, on thirty farms. There is no dam on the project. Water is obtained directly from the Missouri River. Facilities include 11.5 miles of canals, 34 miles of laterals, 31.6 miles of drains, and one pumping plant.¹

Historic Setting and Description

North Dakota straddles the 100th meridian, and comprises 69,300 square miles of mostly semi-arid land. Some 635,000 persons lived there in 1991, ranking the state 47th in population.

1. United States Department of the Interior, Water and Power Resources Service. *Project Data, 1981*. Denver: United States Government Printing Office, 1981, 93, 94.

On average, less than ten people live in each square mile of Dakota's often desolate land; in far western Williams County, the figure is slightly higher. In 1986, many of the county's 26,000 residents lived on 971 farms, and by 1990, the population had declined by almost 5,000 residents, to 21,129. Most farms were over 1,000 acres, and the vast majority were not irrigated.² Moving west from the flatlands found in the eastern part of the state, increasingly rolling lands rise in elevation to near 4,000 feet, losing moisture with every mile. Precipitation averages 14.5 inches a year in Williams County, and temperatures are extreme, ranging from -50 to 110 degrees. The growing season of the county averages 131 days, much of it taking place during the long daylight of northern latitude's spring and summer.

Snow has fallen during every month of the year except July and August, although the amount is minimal compared with similar locations of the United States. The wind in North Dakota has always been an inescapable fact of life, blowing dust across the prairies, and piling up huge drifts of winter snow. Recurring drought plagued the state-in 1885 and 1886, again in 1894, 1900, 1910, and during the "dirty thirties", from 1931 to 1936.³

It appears that North Dakota was settled both by Indians and whites out of necessity, not choice. The Mandans had crossed into the Dakotas around 1300, followed by the largest of the Native American groups in the region, the Sioux, or Dakota, between 1500 and 1700. Both of these groups gradually moved along the rich bottomlands of the Missouri River, and stronger tribes forced both groups to leave their eastern woodlands homeland. The Dakota adopted a highly nomadic lifestyle in the 18th century, relying on the horse and buffalo for their existence.

In 1805, Lewis and Clark camped at the site which would later become Fort Union. Located 1/2 mile west of the present Buford-Trenton Project, Fort Union served as a major

2. U.S. Department of Commerce, Bureau of the Census. *County and City Data Book*, U.S. Government Printing Office, 1988; U.S. Department of Commerce, Economics and Statistics Administration, Bureau of the Census. *Statistical Abstract of the United States*, 1992, 112th edition, U.S. Government Printing Office, 1992; Courtenay M. Slater, and George E. Hall, eds. *1992 County and City Extra: Annual Metro, City and County Data Book*. Lanham, Maryland: Berman Press, 1992.

3. *Project Data*, 94; Robert P. Wilkins and Wynona Huchette Wilkins. *North Dakota: A Bicentennial History*. New York: W. W. Norton and Company, 1977, 7, 10, 13, 14; Frank E. Bair, ed. *Weather of U.S. Cities: A guide to the Weather Histories of 270 Key Cities and Weather Observation Stations in the United States and its Island Territories, Providing Narrative Summaries and Records of Weather Normals, Means and Extremes for Each Observation Point*. Detroit: Gale Research Inc., 1992.

trading post on the Missouri River from 1828 until 1867. Beginning in 1864, the federal government had attempted to control the more hostile Sioux people by erecting a series of military posts along the Missouri River, including Fort Buford.

Following the Civil War, in 1868, the western and eastern branches of the Sioux nation accepted the reality of living on reservations. Quickly, the eastern part of North Dakota along the Red River was settled. With the Northern Pacific Railroad's crossing of the Red River in 1872, settlers filtered into the western portion of the state. By the latter 19th century, the Mandan, Sioux, and other northern plains tribes including the Hidatsa, Arikara, Cree, and Crow, had succumbed to voracious epidemics, encroachment of their lands, and destruction of their food source.⁴

In the mid-1870's, Brevet Major General William Hazen had become outraged when land speculators in the Dakotas gave what he considered highly fictionalized accounts of western North Dakota to *Harper's New Monthly Magazine*. Hazen, at the time, was commander of Fort Buford, which encompassed present Buford-Trenton Project lands. Hazen considered the land west of the 100th meridian as worthless-even with irrigation. Responding to Hazen's comments, Colonel George Custer, stationed at Fort Abraham Lincoln near Bismarck, saw much promise in the land. The Hazen-Custer debate was a microcosm of the larger debate over whether the Great Plains region was desert or garden. The debate was largely academic because settlement of northern and western North Dakota had already begun.⁵ John Wesley Powell, no stranger to the irrigation debate, followed up his famous 1878 arid lands report by visiting many of the areas he mentioned. In 1889, Powell addressed the Constitutional Convention in Bismarck, North Dakota. Powell suggested that the western part of the state should take advantage of river irrigation to insure an adequate water supply in times of drought.⁶

Sixteen years later, Theodore Roosevelt, approved a \$3 million project on the lower Yellowstone, of which almost 20,000 acres were in western North Dakota. Roosevelt was no

4. *Ibid.*, 21, 22.

5. *Ibid.*, 21, 22.

6. *Ibid.*, 95.

stranger to the region. He had tested his ranching mettle at Medora, a few miles south of present-day Buford-Trenton. The Dakota lands included in the Yellowstone project were called "Prosperous Valley", and produced grain, vegetables, and forage crops, but primarily sugar beets. Unfortunately, the cost of irrigation was so high that only a small portion of the project was irrigated.⁷

On November 18, 1904, the original Buford-Trenton Project was authorized by the Secretary of the Interior.⁸ Reclamation specifications in 1905 called for the building of a main canal, a series of turnouts and culverts, a siphon, and several flumes. Pumping machinery was to include two pumping stations, one on a floating barge, and the other in a concrete building along the shore of the Missouri River. Designs called for irrigation of some 11,000 acres.⁹

Early Reclamation attempts to irrigate the area near Buford-Trenton met with limited success. Reclamation began accepting bids for irrigation construction in September, 1906.¹⁰ The original Reclamation project irrigated different land than does the present project. The first project irrigated benchlands at a higher elevation through a five-mile long irrigation ditch and pipeline which moved water from the Missouri River directly into the irrigation system. Electricity for the project came from a lignite powered steam plant in Williston.

The project was operated intermittently until 1912. As early as 1908, with only 38% of the project completed, work ceased and the government property was left in the hands of a "caretaker."¹¹ The *Reclamation Record* of October, 1913 reported that no water had been furnished for two seasons, and "crops were extremely light".¹² A combination of factors led to the abandonment of the original project. Inferior soils and high pumping costs contributed to the project's demise. Furthermore, settlers became indifferent to the methods of irrigation farming as

7. *Ibid.*, 96.

8. *Project Data*, 94.

9. U.S. Department of the Interior, U.S. Geological Survey, Reclamation Service. *Advertisement, Proposal, and Specifications: Buford-Trenton Project, North Dakota*, no. 107 (Pumping Machinery) and no. 108 (Canals and Structures), 1905, 5,21.

10. *Advertisement, Proposal and Specifications*, no. 108, 5.

11. *Reclamation Record*, December, 1908, 108.

12. *Reclamation Record*, October, 1913, 204.

a succession of years with good rainfall made dry farming successful.¹³

By 1929, the year of the great stock market crash on Wall Street, North Dakota was starting to experience the prophecies of John Wesley Powell. Half a century before, Powell warned Dakotans and others that periodic drought was a fact of life in the arid west. If farmers failed to store water for irrigation during such dry spells, they would be sorry. Several years of inadequate moisture, excessive heat, and ever present winds caused dust storms starting in 1934. Valuable topsoil blew away, and massive clouds of dust swept across the prairie. The year 1936 was the hottest, the coldest, and the driest year on record. North Dakotans, like their biblical counterparts, began leaving the state for promised lands further west, especially in California.

While dust storms swept the Great Plains during the "dirty thirties", swarms of grasshoppers destroyed millions of bushels of wheat. Western North Dakota was especially hard hit. In some plains towns, grasshoppers were so thick that streetlights had to be turned on at midday; in others, bonfires were built to destroy the pests as they moved along streets packed four inches thick with the insects.¹⁴

North Dakota was particularly hard hit. The state's per capita income remained less than half that of the national average throughout the thirties. One third of North Dakota farmers lost their property by foreclosure. Relief rolls swelled. In some western counties, more than 70% of the people received some sort of government aid.

A mass exodus from farm lands in the western part of the state occurred. Some farmers flocked to urban centers like Fargo, Grand Forks, Bismarck, or Minot to find work and subsistence. Others simply gave up on North Dakota and moved away.¹⁵ On the Great Plains as a whole, from 1930 to 1939, 501 of the 650 counties comprising the region lost 150,000 families, and an aggregate population of 753,554.¹⁶

According to the earliest Buford-Trenton reports, some 60,000 acres straddling the Great

13. W. G. Sloan, U.S. Department of the Interior, Bureau of Reclamation. *Report on Buford-Trenton Project, North Dakota: Project Investigations Report no. 1*, March, 1938.

14. Wilkins, and Wilkins, 101, 103.

15. *Ibid.*, 102-4.

16. Michael C. Robinson. *Water for the West: The Bureau of Reclamation, 1902-1977*. Chicago: Public Works Historical Society, 1979, 59.

Northern rail line lost significant population in the 1930's. The area, which included project lands, contained a total of 27 persons in 1940, where once families lived on every quarter section.¹⁷

Project Authorization

To address problems on the Great Plains, President Franklin Roosevelt created a Great Plains Committee in 1936 made up of representatives from Reclamation, the Army Corps of Engineers, the Department of Agriculture, and the Works Progress Administration. The committee recommended various allocations to revitalize projects in the west hurt by depression and drought. Of these allocations, \$630,000 was recommended for construction on the Buford-Trenton Project, the first of a number of irrigation projects in the dust bowl of the Great Plains.¹⁸

After two years of political wrangling by congressmen and decision making by the Great Plains Committee, Roosevelt sent Congress on June 14, 1938, a supplemental estimate of appropriations for fiscal year 1939. \$5,000,000 was allocated for the construction of water conservation and utilization projects on the Great Plains and other arid and semi-arid lands. The ensuing legislation, the Interior Department Appropriations Act of 1940, was supplemented by the Wheeler-Case Act, of 1939, of which Buford-Trenton was a part.¹⁹

Wheeler-Case was a cooperative effort of Reclamation and the Agriculture Department. Agriculture's Farm Security Administration (FSA) participated in project planning and preparation of the land. This included levelling the land, building and maintaining drains and small irrigation ditches, and constructing homes and farm buildings prior to settling the area with families.²⁰

Construction History

During the first week of November, 1939, field parties began making topographic surveys for the project. By the end of the year, 11 miles of survey were completed and the Farm

17. U.S. Dept. of the Interior, Bureau of Reclamation. Record Group 115. *Annual Project History, Buford-Trenton Project*, vol.1, 1940, Box 266, 13. (Annual Project Histories cited hereafter as *Project History*, followed by volume, year, and page numbers)

18. *The Reclamation Era*, August, 1940, 234.

19. *Project History*, vol.1, 1939, 1; *Project Data*, 94.

20. Robinson, 59.

Security Administration began acquiring land and property by option.²¹ Soil surveys and early Reclamation studies determined that 13,400 acres of land were suitable for irrigated settlement under the project.²² To this end, the Farm Security Administration began developing and settling the project. FSA planned to settle 95 families on the project in addition to those already there. FSA leveled the entire area to be irrigated, and built five or six-room houses and outbuildings on 135 separate farm units.²³ In 1941, FSA added acreage reclaimed through brush removal, bringing the total irrigable acreage to 14,800 acres.²⁴

In April, 1940, the Works Progress Administration proposal for labor on the project was approved, and by May 6, 37 WPA workers began building a warehouse and construction facilities a quarter-mile north of Trenton Lake at Trenton, North Dakota. The construction camp was next to the Great Northern rail siding and was well equipped with rooms for tools, cement storage, a field office, and machine, carpenter, and blacksmith shops. Workers built transport truck bodies to carry men from Williston to the worksite.

By September of 1940, 340 men, including supervisors and laborers, were working on the project. A higher percentage of skilled labor was hired for Buford-Trenton than was normally required on WPA projects, and a number of equipment operators, carpenters, blacksmiths and welders were hired. The majority of WPA workers were familiar with the work required on an irrigation project, as most had worked on the Lewis and Clark Project, a state project west of Williston.²⁵

An oxbow lake at the far northeast quadrant of the project, Trenton Lake was just west of the proposed WPA campsite. Work on the 100 man camp did not begin until May 27, 1940, three weeks after work on construction facilities began. By June 10, the work camp was in full operation, with a 30'x 60'mess tent, twenty-two 12'x 14' sleeping tents, and a water and sewage

21. *Project History*, vol.1, 1939, 2, 3.
22. *Project History*, vol.1, 1940, 13, 14.
23. *Ibid.*, 23
24. *Project History*, 1941, 17.
25. *Ibid.*, 16, 24.

system.²⁶

On July 23, installation of a gravel processing plant a quarter-mile southeast of the WPA camp began. It would provide gravel for concrete. On August 9, a "a screw type washer" was purchased and placed in operation to remove silt, clay, and coal deposits from the gravel. Excavation and building of some 383 concrete structures on the main canal and lateral system began in the summer of 1940.²⁷

Over its long history, the Missouri River has changed course and flood plain numerous times. The main canal was built on an escarpment jutting up against the former north bank of the Missouri River. Across this bench of land, the canal had a base of 12 feet, and held about 6 feet of water moving at 2 ft./second.

The canal stretched east for almost 12 miles, from a pumping station at the western edge of project lands. When the canal reached the area around Trenton Lake, twelve miles away at the eastern edge of the project, it had to be elevated 23 feet above the lake's surface. Using two flumes and a drainage crossing, Reclamation made such adjustments to avoid ancient channels in the escarpment, and the "Trenton Cut", an area laden with gravel and subject to seepage. Forms for turnouts and other concrete canal features were built in the nearby Trenton shops, and placed in positions across the project.²⁸

Six laterals were built on project lands, two for each of the three bottoms located between the large bends in the Missouri River. Lateral A snaked its way almost parallel to the river for several miles until it branched into three coils in the West Bottom. Lateral B was much shorter, jutting into the bottom for perhaps a mile.

Lateral C followed the north bank of the Missouri for almost its entire length in the Middle Bottom, while Lateral D followed a straight line due east into the heart of this 2nd bottom. In the East Bottom, Lateral E dropped southeast off the main canal for 2 miles before following the Missouri, and hooking northwest into the center of project lands. Lateral F, starting

26. *Project History*, 1940, 7, 27; see also accompanying maps in vol.1 of *Buford-Trenton Annual Project Histories*, 1939-49.

27. *Ibid.*, 7, 8, 16, 39; *Project History*, 1942, 13.

28. *Project History*, 1942, 32, 38.

at the end of the main canal at Trenton, followed the Great Northern Railroad for two miles on its way to Williston.²⁹ Some areas near Trenton Lake or close to the Missouri River had to be lined with concrete or clay to prevent the land in between from becoming saturated. The vast majority of canals and laterals, however, were excavated in natural earth.

Project engineers experienced some difficulty in locating a proper site for the pumping plant. Judging from the terrain and old maps detailing the river bed, the engineers realized the Missouri's banks had changed location several times. Consequently, the location selected had to be stable, where little erosion was likely to occur. The north bank of the Missouri, above the Yellowstone was selected. In addition, the original plans for the pumping plant called for a concrete structure with wooden pilings driven into clay and sand. Eleven feet down, workers hit an artesian flow and the original site was abandoned. In response, reclamation relocated the pumping plant 65 feet inland on a man-made channel. The new designs called for a wooden building to be set on a 2 foot concrete slab. The building and slab were placed on 35, 16" square x 55' long concrete pillars. Electricity was generated by the Montana-Dakota Utilities Company and supplied to the pumps through a 5-mile transmission line from near Nohle Montana.³⁰

Beginning in 1941, the Buford-Trenton Project began to suffer from a labor shortage. In January of 1941, 245 WPA workers were on the payroll. By September, 122 WPA workers were employed, and numbers were dwindling. The reason for the shortage was twofold. Unusually heavy rainfall led to successful harvests in the early 1940's and enticed potential WPA labor to go back onto the area's farms. High crop production was encouraged by United States entry into World War II. Secondly, many WPA workers left the area to join the armed forces or to secure employment in the defense industry.³¹

The rainfall that over Williams County combined with strengthened markets seemed to herald better times. Increased farm income stimulated business, payment of debts, and land sales. For the first time in years, the conditions requiring relief programs improved. In 1942, Williston

29. see accompanying maps found in *Project Histories*, 1939-49.

30. *Project History*, 1942, 24, 25.

31. *Ibid.*, 1942, 44. The figures given for North Dakotans leaving the state in 1942 were 22,000 for defense jobs, and 38,000 for the armed forces.

led the state in the percentage of business increase over 1941. The Federal Land Bank recorded record sales of 180 farms and payment in full of 184 loans. Schools were debt-free for the first time in several years. Farmers harvested bumper crops of alfalfa, barley, corn, flax, hay, oats, potatoes, rye, spring and durham wheat. All local WPA relief projects were shut down except for Buford-Trenton. Reclamation lost not only WPA forces, but also the newly occupied Civilian Conservation Corps (CCC) camp, BR-97. A small conscientious objector camp supplied some labor after the United States entered the war, but numbers were apparently minimal. Project histories of the time attest not only to the concern over the loss of labor, but to efforts to conserve oil, gas, repair parts, and tires for the war effort.³²

Because of the war effort and the consequent loss of labor, the Buford-Trenton Project was not completed until 1943, a year later than expected. In September, 1942, the Buford-Trenton Mutual Aid Corporation was established. It was a non-profit organization established for leasing the federally owned project lands and operating the irrigation system. In July, 1943, the corporation signed a lease contract with the Department of Agriculture. The corporation then began to release the lands to interested farmers. Because their work was completed in 1943, Reclamation transferred jurisdiction of the project over to the Department of Agriculture in January, 1944. That year marked the first full delivery of irrigation water.³³

Post Construction History and Development

Operation and maintenance of the project required the use of heavy equipment, which the Mutual Aid Corporation rented from Reclamation in 1944. Then, in 1948, a three-party agreement between Agriculture's Soil Conservation Service, Reclamation, and the Corporation resulted in Reclamation's reinstatement into the project. Reclamation was pulled back in to take care of maintenance and operation of the irrigation system.³⁴ Water users comprising the Corporation wanted to use Reclamation's expertise to make sure the project was in prime shape before starting repayments.

32. *Project History*, 1941, 12, 18, 19, 20, 42.

33. *Project History*, vol. 5, 1948, 4, 5.

34. *Ibid.*, 4, 5.

In the 1940's, FSA had purchased 8300 acres, and divided them into 112 units developed for irrigation. By 1948, 38 of the units had been sold, and in 1949, 38 more.³⁵ But undeveloped eastern areas of the project were in danger of staying that way.

In the spring of 1945, nature asserted itself on the project. The Missouri River washed away 1000 feet of the main canal in the eastern part of the project, near Trenton. The canal beyond the washout was plugged and fell into disuse while construction was contemplated for the flooded portion. This fact, and the threat of inundation by the proposed Garrison Reservoir downstream, delayed the development of approximately 1,700 East Bottom acres.³⁶

Still the FSA was intent on creating more irrigated farm lands on the East Bottom. Reclamation conducted surveys to find a new location for the canal. In September, 1949, a contract was awarded to the Albert LaLonde Company of Sidney, Montana, to relocate the canal 300 feet away from the washout. Also included in the contract were miscellaneous check structures, five turnouts from the main canal, several gates, two wasteways, five small bridges, an erosion control structure on Eight Mile Creek, and a drain on Painted Woods Creek. Construction was designed to irrigate about 200 acres in the East Bottom. The LaLonde Company began work October 3, 1949, and completed all aspects of the job by June 7, 1950. The main canal, choked by brush below the washout, was cleaned out and refitted with various canal structures by Reclamation force account.³⁷ By 1952, all irrigable lands in the East Bottom section of the project were ready for irrigation, bringing the project total to 9,623 acres.³⁸

Farmers in the West Bottom faced their own problems. The Yellowstone River caused serious bank erosion along the Missouri's north bank, just opposite the confluence of the two rivers. If erosion continued, the main canal paralleling the river would be destroyed.

Experts with the Army Corps of Engineers, Reclamation, and the Soil Conservation Service abandoned a plan to build a series of rock jetties into the river. Instead, Reclamation planned to relocate as much as 2700 feet of the canal in higher ground known as the "old high

35. *Ibid.*, 6; *Project History*, 1949, 8.

36. *Project History*, 1951, 1, 2.

37. *Project History*, 1949, vol. 6, 8, 10, 11; *Project History*, 1950, vol. 7, pp. iii, 6, 7.

38. *Project History*, 1952, vol. 9, 15.

terrace". Reclamation previously irrigated this area during the first decades of the century. Work crews worked throughout the winter of 1948 because equipment was scheduled to be shipped to another project in Wyoming. Work was completed by force account on March 15, 1948.³⁹

Erosion was bad enough under normal circumstances. But, five years after the big flood on the East Bottom, the West Bottom suffered its own flood. In March and April, 1952, rising waters caused damage to buildings, crops, and livestock over a wide area. Despite the losses, gradual river bank erosion was perceived as more detrimental to the longterm success of the project. River bank erosion endangered the pumping plant, the main canal, and major laterals. Part of Lateral A, or 3.8,⁴⁰ extending into the West Bottom, was destroyed in the fall of 1953 when the Missouri River gashed into it. The river threatened to destroy a section of the main canal 1 1/2 miles below the pumping plant, and the plant itself was in danger.⁴¹ The Leo J. Corrigan Construction Company was issued a contract by the Army Corps of Engineers to address the immediate problems near the pump house. The company applied 700 feet of riprap to the river bank just north of the pumphouse inlet channel.⁴²

Serious erosion continued throughout 1953, especially around the main canal and lateral 3.8 in the West Bottom. By March of 1955, the newly created Buford-Trenton Irrigation District replaced the defunct Mutual Aid Corporation. Both groups in the early 1950's had attempted to get the project in "workable condition" before negotiating a repayment plan with Reclamation. Surveys and meetings in Billings, Montana led to an agreement with Reclamation to relocate portions of the main canal and lateral 3.8. Reclamation further agreed to improve the pumphouse facility and wasteways in the east bottom.⁴³

In the spring of 1954, 1000 feet of Lateral 3.8 were relocated inland from the Missouri River. By July 1 of that year, crews relocated several feet of the Main Canal just west of the West Bottom farm units. The canal ran closest to the river at this point, so it was moved north

39. *Ibid.*, 6-8; subsequent project histories give a figure of 1600 feet relocated by force account-see *Project History*, 1951, 1, 2.

40. By the 1950's, the six laterals, A, B, C, D, E, and F were assigned numerical values.

41. U.S. Dept. of the Interior, Bureau of the Reclamation. Engineering Reports, 1955, *Final Construction Report, Buford-Trenton Project*, Specifications No. 600c-139, 1955, 1, 2.

42. *Project History*, 1952, vol. 9, 4.

43. *Project History*, 1953, vol. 10, 2, 3.

500 feet to avoid erosion.⁴⁴

In an effort to satisfy the Buford-Trenton Irrigation District, Reclamation agreed to issue contracts for further work in both the East and West Bottoms. Reclamation awarded two contracts to Walter Mackin and Son, of Billings, Montana. The first contract called for deepening the wasteway and drain of lateral 17.7 in the East Bottom, and laying riprap along Eight Mile Creek in the Middle Bottom. Work was completed by the last week of October, 1955. The second contract called for timber cribbing along the inlet channel at the pumphouse. Work began November 2, 1955, and finished in late June, 1956, one month behind schedule.⁴⁵

In 1955, fears expressed in the late 1940's by the Farm Security Administration and East Bottom landowners became more immediate. Garrison Dam, completed in 1956, was downstream from Buford-Trenton some 150 miles. The Garrison project was part of the Pick-Sloan Plan, a result of separate studies conducted by Reclamation and the Corps of Engineers presented to Congress, in 1944. The Pick-Sloan Missouri Basin Program under the Flood Control Act of 1944, was designed to address the issues of flood control, irrigation, hydroelectric power, and flood control.⁴⁶

At a proposed elevation of 1850 feet, Garrison Dam's backed up water threatened to inundate the lands of the East Bottom. Negotiations between the Army Corps of Engineers and the newly created East Bottom Land Owner's Association, centered around this problem. The Corps wanted to build dikes around the bottom to protect it from Garrison's waters. Landowners, on the other hand, wished to sell their property back to the government. Nothing happened. Both parties failed to reach an agreement by the deadline of December 31, 1955, stipulated in the Public Works Appropriation Bill, of 1955.⁴⁷

By 1957, the Corps was making final arrangements to purchase the landowner's East Bottom lands, exchanging titles and arranging easements.⁴⁸ At the end of the decade, East

44. *Final Construction Report*, 1955, 2.

45. *Project History*, 1955, vol. 12, 2; *Project History*, 1956, vol. 13, 1.

46. *Project Data*, 872.

47. *Project History*, 1959, vol. 16, 2.

48. *Project History*, 1956, vol. 13; and *Project History*, 1957, vol. 14, under "Economics and Development".

Bottom lands were still farmed and irrigated through a special water delivery agreement between the irrigation district and farm operators. Nearly all buildings had been removed, and the East Bottom lands were technically no longer part of the district.⁴⁹

The Corps of Engineers was busy in the late 1950's. Channel changes in the Missouri River threatened to destroy, once again, sections of the main canal and lateral system. This prompted Congress to appropriate funds to study the problem, and find a way around it. Corps sponsored construction was part of a River Bank Revetment Program, part of the larger Garrison Dam and Reservoir Project. A total of \$2 million was appropriated for the Garrison Unit encompassing Buford-Trenton. In May, 1958, the Corps awarded contracts to the James F. Richards Company of Minneapolis, and Tobin Quarries, Incorporated, of Kansas City.⁵⁰

The Richards Company began work on excavating a Missouri River cut-off channel at "Ericson's Bend". Ericson's Bend was the sharpest of the three river bends on the project, separating the East and Middle Bottomlands. A new channel was dredged about 3/4 mile from the former bend, eliminating much of the angle in the river course, and protecting valuable farmland. The project also stabilized the river bank parallel to Lateral 8.9 on the Middle Bottom, and apparently extended a portion of the lateral system.⁵¹ Work started June 18, and finished November 14, 1958.

Tobin Quarries built 7300 feet of stone-filled toe trenches adjacent to Lateral 8.9, and along the river in the West Bottom. Tobin also built nine finger dikes to divert water from the project's western farmlands. An additional contract was awarded in 1960 to Peter Kiewit Sons' of Billings, Montana to further stabilize the river bank in the West Bottom. The work of laying 88,000 tons of rock along the river was completed in April of 1960.⁵²

Reclamation continued their efforts to better the irrigation district by carrying out maintenance and improvement projects of their own. The District did the work and Reclamation reimbursed the District for expenses. Work included cleaning of canals and drains, minor repairs

49. *Project History*, 1959, vol. 16, 2.

50. *Project History*, 1958, vol. 15, 3.

51. *Project History*, 1958, 4. A 3, 250 foot lateral, (8.9K), was built at this time according to project histories.

52. *Ibid.*, 3, 4; *Project History*, 1959, vol. 16, 3.

at the pumping plant, and construction of checks and turnouts at the Trenton shops for placement throughout the project.⁵³

Besides erosion and maintenance concerns, by 1962, the district had experienced periodic water shortages. Two factors caused this. Dry weather in the late 1950's was one. The other reason lay upstream at Fort Peck Dam. There, officials regularly held back water during the summer months to be released during the winter when power needs were greatest. Unfortunately, Buford-Trenton needed the water in the summer for irrigation. The district was forced to initiate a rotation schedule to serve the needs of customers in the project.

Fort Peck authorities agreed to release water when crops downstream were in danger of drying up. The lag time between notification by the district and release at Fort Peck was problematic. Therefore, following a June 5 meeting with the Corps, Reclamation, and the State Water Commission, the district decided to modify its pumping plant to enable it to suck up water when levels were low. Adjustments were made to the three pumps at the pumphouse, and plans were made to install an auxiliary pumping unit at Trenton Lake.⁵⁴

In January, 1963, the Dougherty Construction Company started modification of the pumping station on the Missouri River. On April 20, work was finished. A State Water Commission crew and two district men began construction of Trenton Lake Pumping Plant on April 1. Water rights from the lake were granted to the district on April 24.

In May, Westgate Spray and Concrete Company of Bismarck won the bid to supply two 9,000-gallon pumps and motors at Trenton Lake. Hardware was delivered in mid July, and by July 29, construction of Trenton Lake pump station was complete. On August 8, pumping from the lake began, but four days later, the district's Board of Directors disapproved the installation due to malfunction. The 50 HP engines had been cutting out at regular intervals, forcing their shutdown.⁵⁵ In subsequent years, pumps were used at Trenton Lake, but ascending or descending water levels forced their shutdown or removal. In the late 1960's water levels in the

53. *Project History*, 1959, 2.

54. *Project History*, 1962, 2.

55. *Project History*, 1963, 1,2.

lake were so low that the pumps served no purpose. In 1976, water levels rose above the pumping units, and they were shut down.⁵⁶

Erosion and flooding problems returned in 1964 and 1965, when a section of the East Bottom main canal was washed out. Four days later, on July 9, Jones Construction of Sidney, Montana, started to replace the canal section. Meanwhile, the district constructed a temporary canal to facilitate seasonal pumping. An ice flow threatened to flood the entire holdings along the west bottom, in April of 1965. Residents were evacuated, and machinery was moved to higher ground.⁵⁷

The possibility of flooding increased after 1956, with completion of the Garrison Dam. Although East Bottom farmers continued to lease government lands there, fluctuations in the height of Sakakawea Reservoir affected their future. Today, the reservoir sits at 23 feet below operating capacity for the dam, and some 450 acres of the East Bottom are grown in hay. In 1975 and 1976, the entire project became waterlogged, as water levels reached record levels.⁵⁸

Operation and Maintenance

The Buford-Trenton Project required a significant amount of maintenance, because the main canal and laterals were largely of unlined earth construction.⁵⁹ Heavy equipment was necessary to clean and sometimes relocate water delivery structures. Because areas adjacent to the river were lower than the river itself, construction crews used massive truckloads of fill to maintain lateral channels with the proper elevation and slope. Often, workers had to build a series of drains and culverts beneath these structures.

Weeds were a recurring menace throughout the project's history. Most of the operation

56. Information gained through telephone conversation with Buford-Trenton Irrigation District Board Member, Robert Gannoway, July 15, 1993.

57. *Project History*, 1964, 1, 5; *Project History*, 1965, 1.

58. Robert Gannoway, July 15, 1993.

59. Because canals and laterals were mostly unlined, the acre-feet diverted from the Missouri River dwindled to about half by the time it reached project fields. The acre-feet diverted and delivered for 1947-51 (*Project History*, vol. 8, 1951, 13) are shown below:

	1947	1948	1949	1950	1951
Acre-Feet Diverted	10,507	19,563	30,948	11,483	24,630
Acre-Feet Delivered	4168	10,087	18,073	4242	12,183

The annual average diversion of river water for this period was 14,631 acre-feet. The average diversion for the years 1973-7 was 23,700 acre-feet, (*Project Data*, 94).

and maintenance sections in project reports were devoted to this problem. Several times a year, the Buford-Trenton Irrigation District launched a series of seemingly military assault operations against the stubborn invaders. Equipped with 2,4-D Ester, and other assault weapons, crews attacked the enemy along every lateral and drain of the project. The enemy included yellow mustard, French weed, lamb's quarters, willow trees, cattails, and thistle.

As if weeds were not enough, the crafty beaver matched wits with district personnel, and proved to be a worthy opponent. The district tried dynamite to blow up numerous dams clogging drains and laterals. They hired professional trappers. Neither idea was wholly successful. The beavers eluded capture for the most part, and rebuilt their blown up dams overnight.⁶⁰

Settlement

Settlement of the Buford-Trenton Project tended to follow the development of lands by the Farm Security Administration. Project population figures showed a dramatic increase during the decade of the 1940's, from 6,327 in 1941, to 14,000 in 1950.⁶¹ By the end of the 1940's, the FSA had divided some 8,300 acres into 112 farm units, and settled 38 of them. By the end of the next year, a total of 76 units had been settled. By 1951, the FSA developed the remaining farm units in the East Bottom.⁶²

Of course, by the late 1950's, settlers and farm structures had been removed from the East Bottom, owing to construction of Garrison Dam. Population on the actual project tended to go down because of the dam, and paralleled the national trend for larger farms and fewer operators over the last half century.⁶³ In 1977, 148 persons received irrigation service on 30 farms, and 7,655 acres.⁶⁴

Irrigable acreage fluctuated, from projections of near 15,000 acres at the project's inception, to some 7,200 actual acres in 1948, 7,578 in 1949, 8,199 in 1951, 9,623 in 1952, and 9,461 acres in 1953. From the mid-1950's to the late 1970's, acreage hovered between 7,000 and

60. Numerous references to the weed and beaver problems can be found in *Project Histories* from the 1940's through 1965.

61. *Project History*, vol.1, 1941, 55; *Project History*, vol.8, 1951, 13.

62. *Project History*, vol.5, 1948, 6; *Project History*, vol.6, 1949, 8; *Project History*, vol.8, 1951, 10.

63. *Project History*, vol.16, 1959, 2.

64. *Project Data*, 94.

7,700 acres. Such totals depended upon the amount of progress by Reclamation and FSA, upon periodic flooding and erosion, and upon removal of lands from the project.

Sugar-beets, alfalfa, wheat, barley, oats, and pasture were the standard crops grown on the project, although there were others.⁶⁵ In 1939, before construction was complete, yields of 7 bushels of wheat/acre were recorded. In 1940, the amount had risen to 9 bushels, and in 1941, the number was 22.8. Also in 1941, the project witnessed its first cattle and sheep since before the drought of the 1930's.⁶⁶ In 1942, state crop harvests were 33% higher than in 1941, setting records in wheat production, barley, and livestock.⁶⁷ Sugar beets, alfalfa, small grains, and forage continued to serve as chief products of the project, the latter supporting a growing sheep and livestock business.

Conclusion

The Buford-Trenton Project was the first of the recommended Great Plains projects initiated in the 1930's to relieve drought and economic suffering. Although it is a relatively small project, its success helped to stabilize the population in Williams County, fostering economic recovery. The project generated relief jobs during the Great Depression, and established a foundation for agricultural revenue in northwest North Dakota.

65. *Project Histories* mention also: corn, flax, grain hay, grass hay, oats, potatoes, and rye.

66. *Project History*, vol.1, 1941, 45.

67. *Project History*, vol.1, 1942, 43.

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